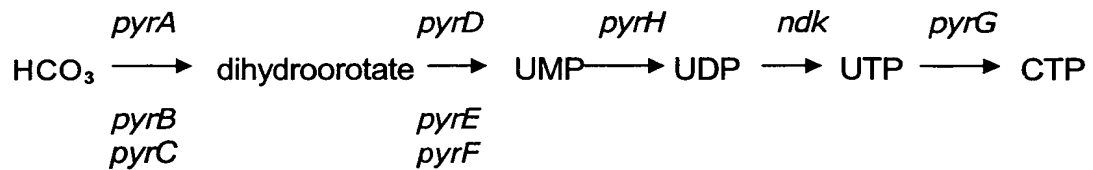


Figure 1a: Diagram of the "de novo" pathway of UTP and CTP in *E. coli*

ndk: nucleoside diphosphokinase

pyrA: carbamoylphosphate synthase

pyrB: aspartate carbamoyltransferase

pyrC: dihydroorotase

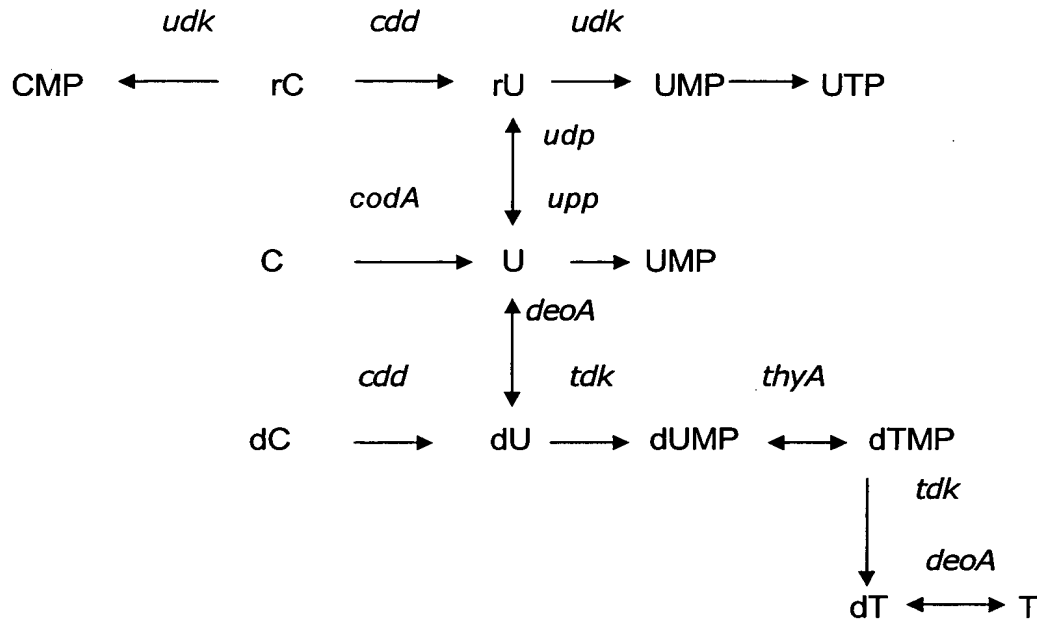
pyrD: dihydroorotate oxydase

pyrE: orotate phosphoribosyltransferase

pyrF: orotidine 5'-phosphate decarboxylase

pyrG: CTP synthetase

pyrH: UMP kinase

Figure 1b: Recycling route of pyrimidines in *E. coli*

cdd: cytidine/deoxycytidine deaminase

cmk: CMP/dCMP kinase horylase

codA: cytosine deaminase

deoA: thymidine phosphorylase

tdk: thymidine kinase

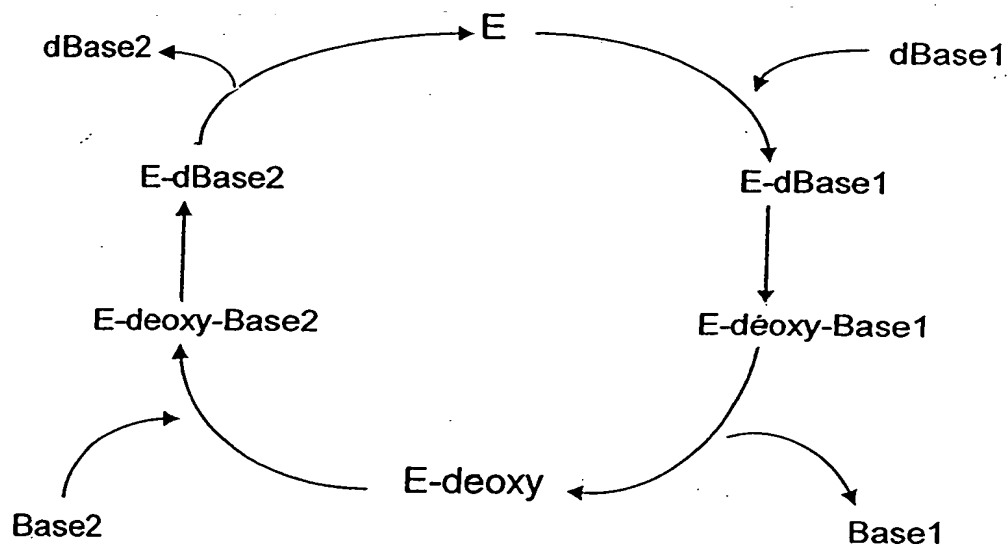
udk: uridine/cytidine kinase

udp: uridine phosphorylase

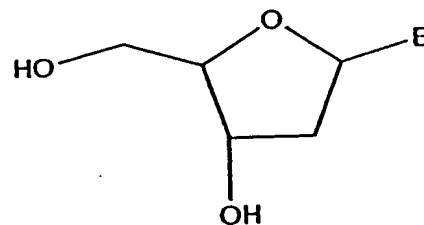
upp: uridine phosphoryltransferase

thyA: thymidylate synthase

The enzymes are represented above by their corresponding genes.



* E-deoxy = enzyme-deoxyribose of the form
(E = active site of the enzyme)



*dbase = deoxyribonucleotide

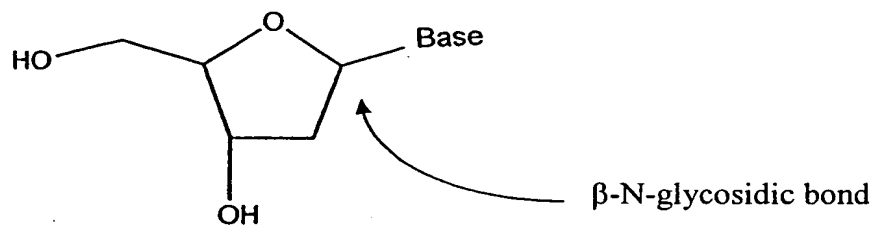


Figure 2

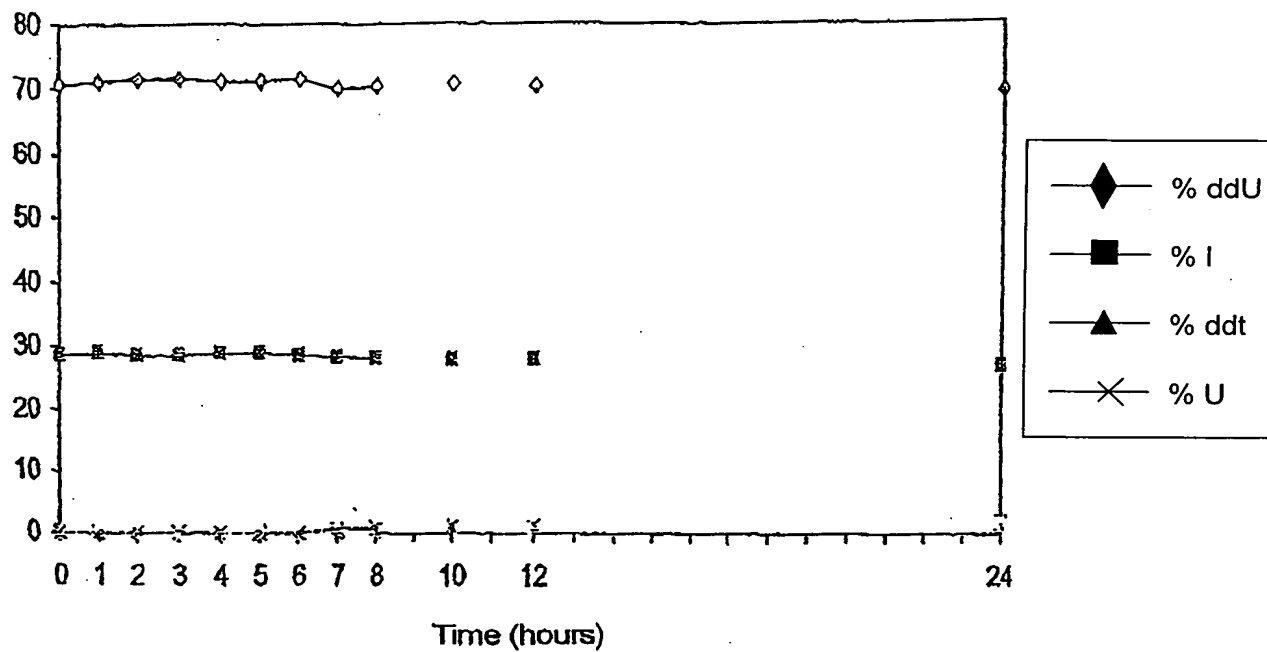
Reaction $ddU+f=ddl+U$ for $psu-ntdA$ 

Figure 3

Reaction $ddU + I = ddi + U$ for $psu-ntd^+C$

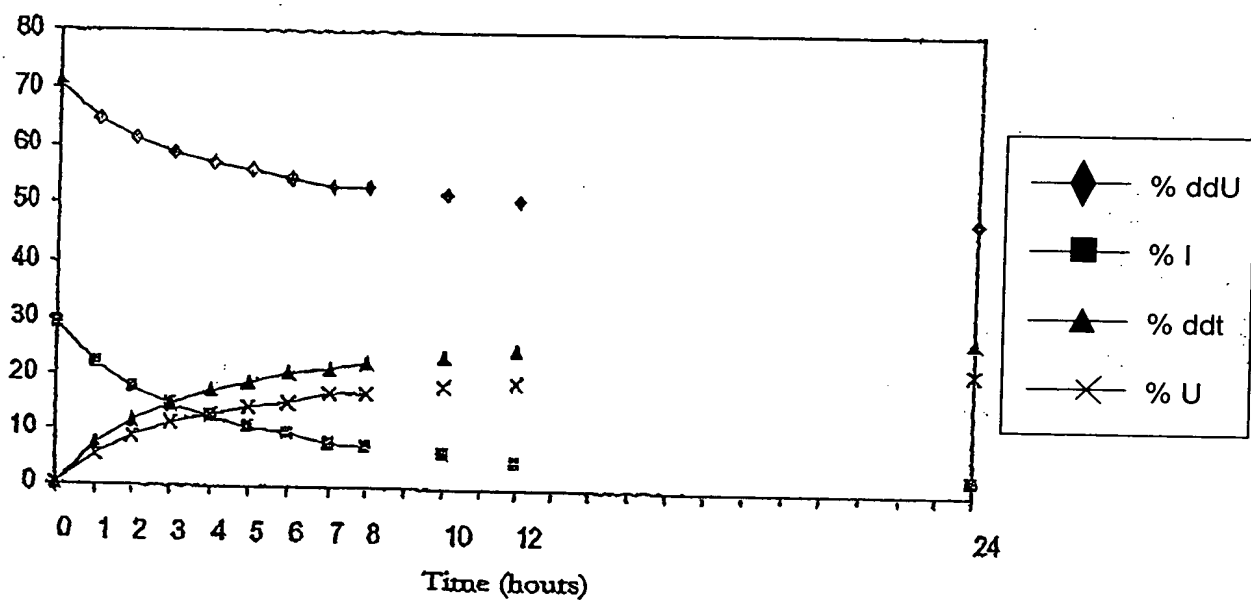


Figure 4

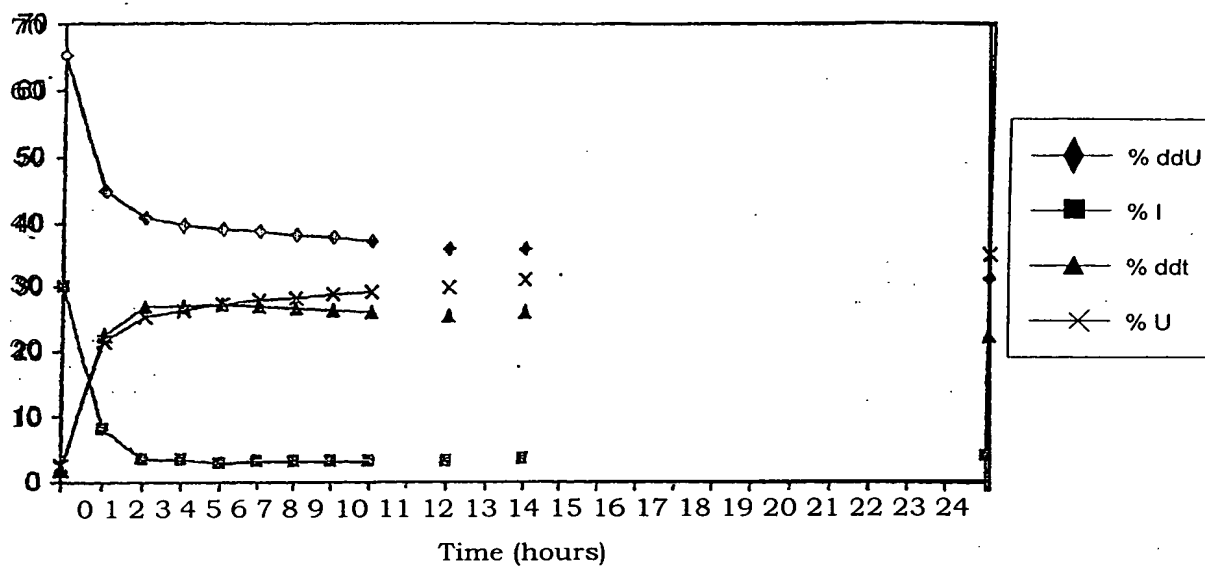
Reaction $dU+i=dI+U$ for pSU-*ntdA*

Figure 5

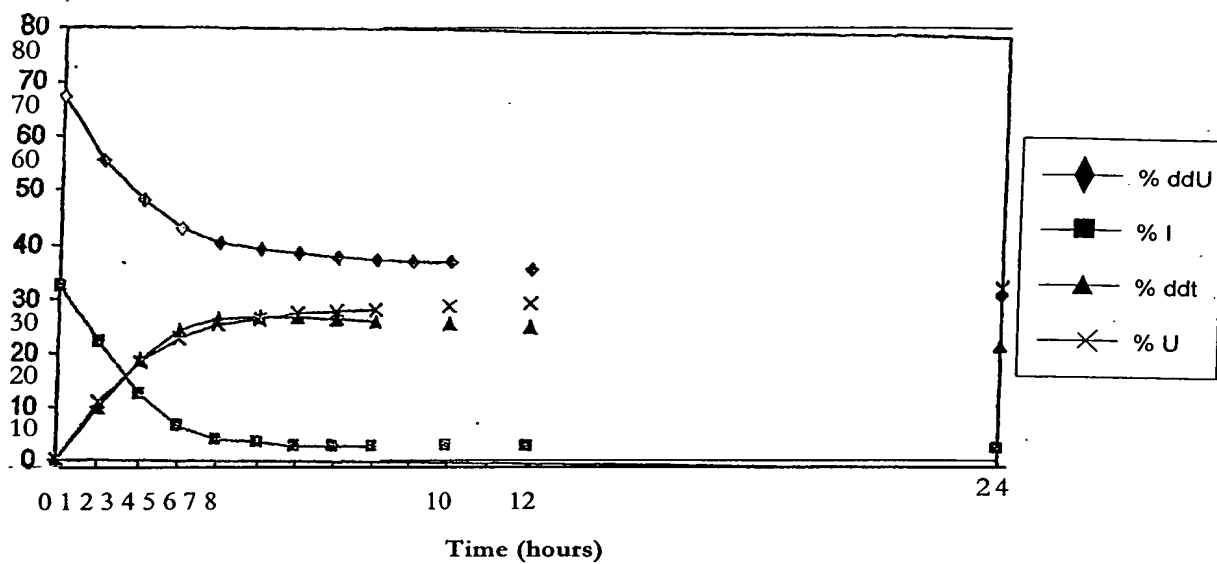
Reaction $dU+I=dl+U$ for pSU'ntd*C

Figure 6